

REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

I. Interview Summary

Applicants thank Examiner Sayadian for the courtesy extended during the telephone interview with Applicants' representative Feng Ma (Reg. No. 58,192) on March 1, 2011.

Although the Examiner invited Applicants' representative for an interview on page 2 of the final Office Action, during the interview, the Examiner stated that no substantive issue can be discussed because the present application is under final rejection. Rather, the Examiner suggested that if Applicants choose to file an RCE, a further interview and a supplemental amendment can immediately follow the RCE. The Examiner further suggested that Applicants should present structural differences between the claimed embodiments and the prior art.

No agreement was reached during the interview.

II. Status of the Claims

Claims 10, 12-17, 19, 20, 22-27 and 29-33 are pending in this application. By way of this Amendment and Reply, all the claims have been amended for clarification purposes. Support for the amendments can be found in the currently-pending claims, and throughout the Specification, for example, in paragraphs [0023] and [0038] of the published application (Pub. No. 2006/0285789). No new matter is added.

III. Claim Rejections under 35 U. S. C. § 103

A. Claims 10, 12-15, 17- 20, 22, 23, 25, 27, and 29-33

In Section 3 of the Office Action, Claims 10, 12-15, 17- 20, 22, 23, 25, 27, and 29-33 (though Applicants note that actually Claims 10, 12-17, 19, 20, 22-27 and 29-33 are pending) were rejected under 35 U.S.C. 103(a) as being unpatentable over WO/2004094956

("Michalewicz-1") or its U.S. equivalent Pat. No. 6,707,308 ("Michalewicz-2," referred to as "AAPA" in the Office Action) in view of any of U.S. Patent Nos. 5,265,470 ("Kaiser"), 5,756,895 ("Kubena"), 6,534,839 ("Frazier"), 5,367,136 ("Buck"), and 5,461,916 ("Fujii"). By way of this Amendment and Reply, all the claims have been amended. To the extent that the Examiner may still apply the rejection to the claims as amended, this rejection is respectfully traversed.

Independent Claim 10 recites, among other elements, that "the at least one **pair of solid state hinges** are configured to **permit a motion** of the second substrate **in a direction substantially parallel** to the surface of the first substrate but substantially **prohibit a motion** of the second substrate **in a direction perpendicular** to the surface of the first substrate," and that "the pair of solid state hinges are disposed on **opposite sides** of the second substrate." (Emphasis added.) Independent Claims 20 and 33, though different in scopes, recite similar or related elements.

In contrast, the references cited in the Office Action, whether considered separately or in a combination, fail to disclose, teach, or suggest at least the above feature.

On page 2 of the final Office Action, the Examiner asserted that the phrases of "lateral," "transverse," and "perpendicular" recited in the previously-presented claims may have indefinite scope in view of the Merriam-Webster dictionary definitions. Although Applicants do not necessarily agree with the Examiner, Applicants have amended the claims to remove the recitations of "lateral" and "transverse," and to clarify that the "perpendicular" direction is with respect to, for example, the surface of the first substrate.

On page 3 of the final Office Action, the Examiner asserted that "absent reciting structural limitations achieving the functional effect, ..., a functional recitation ... not distinguishing scope of an apparatus claim over a prior art apparatus capable of performing the intended-use...." (Emphasis original.)

In response, Applicants respectfully submit that the claims do recite structural limitations. For example, Claim 32 recites that "wherein webs of the at least one pair of solid state hinges each are substantially thinner in the motion direction parallel to the surface of the

first substrate than in the direction perpendicular to the surface of the first substrate,” which are structural limitations according to one embodiment, to realize that “the at least one pair of solid state hinges are configured to permit a motion of the second substrate in a direction substantially parallel to the surface of the first substrate but substantially prohibit a motion of the second substrate in a direction perpendicular to the surface of the first substrate” recited in Claim 10. Furthermore, as discussed in detail below, even the functional effects recited in the claims are not achieved in the prior art references.

On page 4 of the Office Action, the Examiner conceded that the “AAPA” fails to disclose using a post as a hinge to maintain the positioning of two opposing substrates, but asserted that “*a hinge is art recognized equivalent to the wrap* used in AAPA for the purpose of maintaining the position of two opposing substrates.” The Examiner further stated that “it would have been obvious ... to have modified the AAPA to elastically hold the top substrate and its conductors with respect to the lower substrate and its conductors by replacing the wrap 340 at each end with a hinge at each end, *because a hinge is both suitable to hold substrates at a given distance and its function is equivalent to the wrap's holding function*, as taught by any of ‘Kaiser,’ ‘Kubena,’ ‘Frazier,’ ‘Buck,’ and ‘Fujii.’” as evidence. (Emphasis added.) Applicants respectfully disagree.

Contrary to the Examiner’s assertions, the cited references teach away from holding substrates “at a given distance” using a hinge. Rather, the hinge as taught in all these references allows a motion of an end portion of a cantilever perpendicular to the substrate, thereby *varying* the distance between the cantilever and the substrate. Furthermore, there appears to be a missing step in the above arguments to arrive at the “hinge” from the “wrap.”

The defective rejection above appears to be connected to the fact that the Examiner has relied upon the references to supply “a hinge,” while in fact the claims being rejected recites “at least **one pair** of solid state hinges.” As detailed below, one **pair of hinges are different from a single hinge**, and the systems having a single hinge as taught by the references cannot be modified to have a pair of hinges, otherwise the systems in the references would become inoperable or unsatisfactory for their intended purposes. Thus, the

references, even if combined, would still have a missing element of “at least one pair of solid state hinges.”

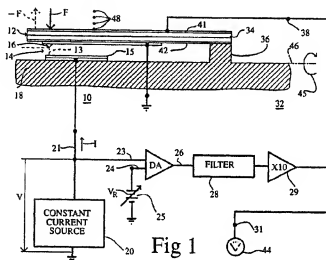
On page 7 of the Office Action, in the “Response to Arguments,” the Examiner asserted that the “non-AAPA prior art modifies the AAPA; it needs not be modified.” Applicants respectfully disagree. The “non-AAPA prior art” fail to supply a “pair” of hinges and thus, if relied upon to modify “AAPA” to arrive at the claimed embodiments, **must** themselves be modified to have a “pair” of hinges first.

Specifically, Kaiser teaches (see, e.g., Fig. 1, reproduced below) driving the beam 34 in a *vertical direction to vary the gap 14* between the tunneling tip 16 that is at the *free end of the beam*. Thus, Kaiser does not supply “a pair” of hinges, or the motion “**In a direction substantially parallel** to the surface of the first substrate,” nor are the beam 34 and tip 16 “parallel.” Rather, modifying Kaiser to have “a pair” of hinges on opposite sides of the beam 34 would only **hinder the ability of the supposedly “free end” to move freely**.

On page 4 of the Office Action, with respect to previously-presented Claim 12, the Examiner asserted that the hinges of the references result in “stiffness in the lateral direction (allowing the substrates to move towards each other, for example).” (Emphasis added.) With the removal of the phrase “lateral” through the claim amendments, the Examiner’s argument above actually supports Applicants’ arguments that the references fail to disclose, teach, or suggest that “the at least one pair of solid state hinges are configured to permit a motion of the second substrate in a direction substantially parallel to the surface of the first substrate but substantially prohibit a motion of the second substrate in a direction perpendicular to the surface of the first substrate” recited in amended independent Claim 10.

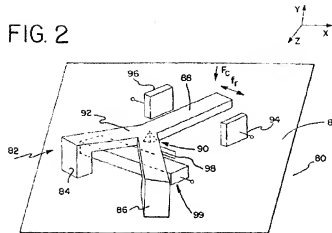
Furthermore, although Kaiser is silent with respect to the size of the gap 14, it is likely that the gap 14 is larger than 15 nm due to the use of the tip as opposed to tunneling between elongated conductors. If Kaiser were modified to have a gap of 15 nm or less, the flexibility of the beam 34 as required by Kaiser, under the vertical drive force, or even under gravity, will likely result in the bending of the beam 34 thereby closing the gap of 15 nm or less and causing a short circuit.

If a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Thus, there is no reason, motivation, or suggestion to combine Kaiser with “AAPA” or to modify the teachings therein to arrive at the claimed embodiments.

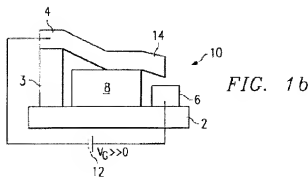
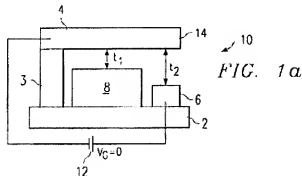


Kubena, like Kaiser discussed above, also teaches (see, e.g., Fig. 2, reproduced below) a cantilever 88 having a free end allowing a vertical motion caused by the Coriolis forces F_c . In addition, Kubena also teaches a configuration employing a tip 90. Thus, it would be also inoperable or render the system of Kubena unsatisfactory for its intended purpose if Kubena were to be modified or combined with other references. In addition, the combination would still have missing elements.

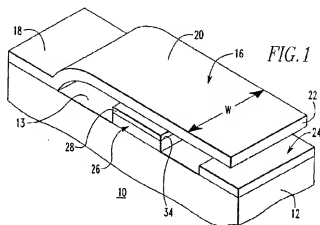
FIG. 2



Frazier is directed to a switch (see, e.g., Figs. 1a and 1b, reproduced below) having a free-end cantilever beam 14, which requires a vertical motion to open or close the switch. Thus, for reasons similar to those discussed above with respect to Kubena and Kaiser, Frazier cannot be combined with other references, and even if combined, the modified teachings do not arrive at the claimed embodiments.

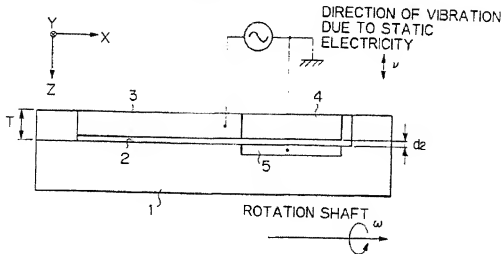


Buck also teaches an unsupported cantilever 16 (see, e.g., Fig. 1, reproduced below). The width W of the cantilever 16 clearly *prohibits a motion in the direction parallel to the surface of the substrate*. Thus, Buck teaches away from the claimed embodiments.



Like the references discussed above, Fujii also teaches a cantilever beam 4 that has a free end and requires a vertical motion (see, e.g., Fig. 2, reproduced below). Thus, modifying Fujii to have a pair of hinges on opposite sides of the beam 4 would also render this system being modified unsatisfactory for its intended purpose.

Fig. 2



In view of the above, the cited references, even if combined, fail to disclose, teach, or suggest all of the elements recited in amended independent Claims 10, 20, and 33. In addition, there is no reason, motivation or suggestion to combine these references, and many of the references teach away from the combination. Thus, Claim 10 and its associated dependent claims are patentable over the cited references for at least the reasons set forth above.

On page 5 of the Office Action, with respect to previously-presented Claims 15, and 23, the Examiner asserted that (with emphasis added):

Kubena is evidence that two hinges can be used instead of one hinge to hold each end/side of a substrate. See, for example, FIGs. 2 and 4 showing hinges 84 and 86 holding the same end/side of the substrate 88, instead of the single hinge 210 holding the end/side of the hinge 204.

Using a pair of hinges is art recognized suitable approach to hold one end/side of a substrate and also art recognized equivalent to using a single hinge to hold and end/side of a substrate.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention of this application to have modified the AAPA to elastically hold the top substrate and its conductors with respect to the lower substrate and its conductors by replacing the wrap 340 at each end with a pair of hinges at each end, as taught by any of “Kubena.”

Applicants respectfully submit that these statements actually support that the claimed embodiments, at least those recited in the amended claims, differ from even the modified system of Kubena. For example, amended independent Claim 10 recites that “the pair of hinges are disposed on opposite sides of the second substrate,” Claim 12 further recites that “the pair of solid state hinges are substantially aligned with each other,” and independent Claim 33 recites “at least one pair of substantially aligned solid state hinges on opposing sides of the second substrate.” These clearly differ from, and are nonobvious over, the “two hinges ... instead of one hinge to hold each end/side of a substrate” as suggested by the Examiner based on Kubena.

In view of the above, Applicants respectfully request withdrawal of the rejections of Claims 10, 12-17, 19, 20, 22-27 and 29-33.

B. Claims 16 and 24

In Section 4 of the Office Action, Claims 16 and 24 were rejected as being unpatentable over PGPUB US 2006/0285789, i.e., the published present application, in view of Roundtree (U.S. Patent No. 5,977,596) because the features recited in Claims 16 and 24 allegedly lose their filing date and were accorded priority as of the filing of the amendment introducing them.

As discussed above, the base Claims 10 and 20 are believed patentable over these references. Roundtree fails to supply what the other references lack. Thus, Claims 16 and 24 are allowable for at least the same reasons.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejections of Claims 16 and 24.

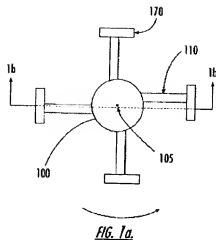
D. Claim 26

In Section 5 of the Office Action, Claim 26 was rejected as being unpatentable over “AAPA,” “Michalewicz-1,” “Michalewicz-2,” in view of any of Kaiser, Kubena, Frazier, Buck, and Fujii, further in view of Hill (U.S. Patent No. 6,137,206).

Claim 26 depends from Claim 20. For at least the reasons similar to those discussed above with respect to Claim 10, AAPA, Michalewicz-1, Michalewicz-2, Kaiser, Kubena, Frazier, Buck, and Fujii fail to disclose, teach, or suggest all the elements recited in Claim 20. Hill fails to supply what the other references lack. Thus, Claim 26 is patentable over the cited references for at least the reasons set forth above.

In addition, amended Claim 26 recites, among other elements, that “at least two of the solid state hinges are aligned with the center of the second substrate.”

In contrast, the cross-shaped support structures in Hill are “mis-aligned,” (see, e.g., Fig. 1a, reproduced below).



Thus, Claim 26 is patentable over the cited references for at least this additional reason, and Applicants respectfully request withdrawal of the rejection of Claim 26.

VI. Conclusion

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing or a credit card payment form being unsigned, providing incorrect information resulting in a rejected credit card transaction, or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith,

Applicants hereby petition for such extension under 37 C.F.R. §1.136 and authorize payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date March 28, 2011

By Michael D. Kaminski

FOLEY & LARDNER LLP
Customer Number: 22428
Telephone: (202) 672-5490
Facsimile: (202) 672-5399

Michael D. Kaminski
Attorney for Applicants
Registration No. 32,904